

Sandia researchers win three R&D 100 Awards

Ion Electron Emission Microscope, polymer hydrogen getters, semiconductor growth process are chosen

By Chris Burroughs

Three Sandia research teams — one from New Mexico and two from California — have won R&D 100 Awards in the annual competition for innovative technology sponsored by *R&D Magazine*, a trade magazine based in the Chicago area.

Teams of technical experts chosen by the magazine select 100 winners of the annual contest. The winners must not only be original but also show promise of real-world application.

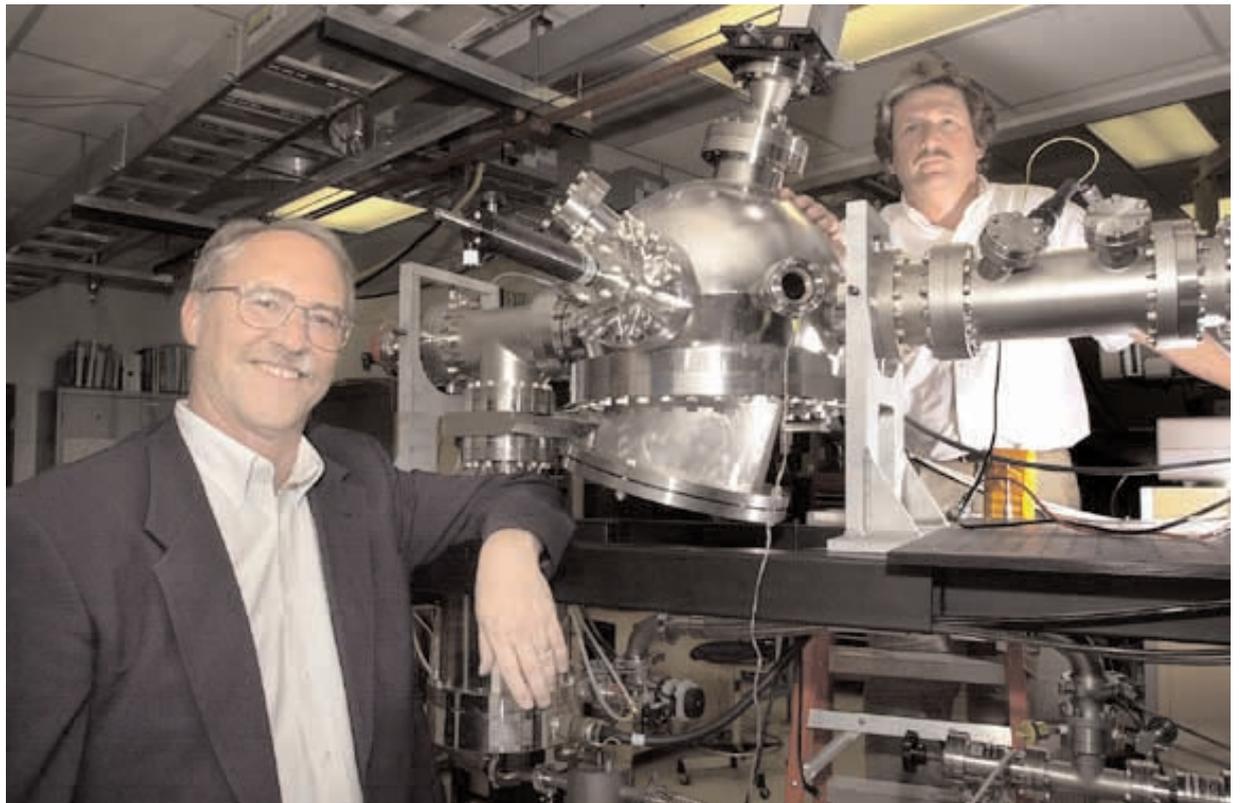
Prizes in the form of plaques will be presented at a banquet hosted in October by the magazine at Chicago's Museum of Science and Industry.

The Sandia winners invented an Ion Electron Emission Microscope, polymer hydrogen getters, and a new process for growing compound semiconductors of cadmium-zinc-telluride for room temperature radiation detection.

"Sandia's R&D 100 winners this year represent those fundamental advances in technology that are so essential for making progress in other fields," says Labs President and Director C. Paul Robinson of the awards. "All three awards represent new inventions, and all three make significant strides in extending the state of the art, but at the same time each is extremely cost-effective over past methods.

"Developing such 'systems solutions' is what we have been emphasizing as Sandia's reason for being, and it is very rewarding to see the R&D 100 Awards honor the work. I am also pleased that two of the three awards included team members from industry and universities. Technology partnerships are also a major thrust, and these awards indicate just what is possible through such teaming efforts."

Summaries of the winning technologies follow:



RESEARCHERS Barney Doyle, left, and George Vizkelethy (both 1111) stand next to the Ion Electron Emission Microscope they developed. The technology won them an R&D 100 Award. Three Sandia research efforts won the prestigious award this year. (Photo by Randy Montoya)

Ion Electron Emission Microscope

The Ion Electron Emission Microscope (IEEM), invented by New Mexico-based researchers Barney Doyle and George Vizkelethy (both 1111), Robert Weller of Vanderbilt University, and Berthold Senfinger of Staib Instruments Inc. in Germany, is the first

device that allows scientists and engineers to microscopically study the effects of single ions on semiconductors, integrated circuits, and biological specimens without having to focus the MeV ion beam. The IEEM nomination was

(Continued on page 4)



On Mother's Day Sandian Ed Schaub did something no one has done legally for 30 years: He reached into a peregrine falcon's cliff-side nest and adopted a four-day-old chick. Read about the master falconer's adventures in John German's special double-page spread. (Click here to open story.)

Sandia efforts may lead to safer, less expensive nuclear power plants

By Chris Burroughs

Future US nuclear power plants might be safer, more efficient, and less expensive to build thanks to the efforts of several Sandians who are working with the US Nuclear Regulatory Commission (NRC) to develop new approaches for regulating reactors. This work is an extension of efforts to modify existing regulations for currently operating reactors.

Sandia, which has been doing probabilistic

Rep. Heather Wilson, R-N.M., came to Sandia last week to say "thanks" to Labs employees for the work they've done over the years to help build America's energy security. Read about her visit in Bill Murphy's story on page 8.

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Sandia LabNews

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FY02 compensation package unveiled; raises tied to employees' 'value of contribution'

By Bill Murphy

In the annual series of town meetings in California and New Mexico held last week, the Labs' FY02 compensation increase package for nonrepresented employees was unveiled.

The compensation package, when officially authorized, will reflect the approval of both Lockheed Martin and DOE. Sandia HR Strategies and Services Dept. 3050 Manager Karen Gillings noted that the compensation package was "like Ivory Soap, 99 and forty-four one-hundredths percent approved." An "i" or two still needed to be dotted and a "t" or so crossed by DOE, she said, "and we cannot call the numbers 'official' until that approval comes. But, since compensation review is well underway across the Laboratories, we wanted to communicate the status of this year's package as it stands today."

As a matter of policy, the actual compensation numbers aren't widely publicized except at the

town hall meetings. The range of numbers presented by Karen, however, indicated base salary increases, as well as nonbase compensation across all nonrepresented job classifications. Notably, technical managers will see the largest percentage raises — on average — of any job classification.

It is important to note that raises vary from individual to individual. The numbers announced by Karen represent an increase in the amount of money in the salary pot for various classifications. That doesn't mean that every employee in a particular classification will see that amount of a raise.

Let's get hypothetical. Assume the approved raise package includes 6 percent more money in FY02 for the widget refurbishing job classification salary pot. That doesn't mean that every widget refurbisher will get a 6 percent raise. Sandia has a commitment to link pay to performance. That's

(Continued on page 4)

Sandia intern will represent New Mexico at annual Miss America pageant in September

9

Sandia successfully deploys targets during latest flight test in national missile defense series

12



This & That

Too late to hurry – Sandia has many tough jobs, but few take more patience than those of our protocol officers, who plan for and escort VIP visitors. I know because I work with the protocol staff (12650-1) when a DOE, congressional, or other notable visitor is holding a news conference.

One maddening part of their jobs is putting together agendas for high-level visitors like senators, the energy secretary, military bigwigs, and company CEOs because the agendas often change several times before the visitors arrive, and even after. Sometimes, the visits even fall through after the agenda has gone through many revisions. I don't know whether it's a record, but protocol officer Yvonne Hodges said an agenda for one recent VIP visitor went to *revision 18* before he arrived.

Through it all, the protocol folks usually keep smiling. But recently, as I passed her in the hall, protocol program manager Bobbie Burpo's smile looked a little weak around 4:30 p.m. as she was preparing for an important visitor the following day. I asked Bobbie whether she was hurrying to get ready for the visit. She looked at me, in full smile now, and said, "Nope. It's too late to hurry now!"

* * *

Amusing business names – Thanks to all who sent amusing business names in response to my June 29 request. Unfortunately, there are several amusing ones I can't print in our "family" newspaper (see me in the hall for those). Here are some good ones that I can print, along with the names of people who submitted them. To save a little space, I'm not printing the business locations, but most folks included that info:

- The "He Ain't Here" bar (with lots of pickup trucks in the parking lot and two or three dogs tied up nearby; Vicki Walker, 15330).
- "Belly Acres" recreational vehicle park (Anne Cosbey, 7851).
- "Daddy Diddit" maternity shop and the "Curl Up and Dye" beauty salon (Marti Butler, 5701; "Curl Up and Dye" also from Marilyn Goodrich, 5711).
- "Boxwell Brothers Funeral Home" (Jay Hammond, 2953, and Bob Austin, retiree).
- "Quick and Stiff Funeral Home" (Hilt Souther, retiree).
- "A Room with a Vieux" antique shop ("vieux" is French for "old") and "The Java Flow" coffee shop near Mount St. Helens (Mark Shuchat-Marx, 9624).
- The "Auger Inn" airport restaurant (Gary Hoe, 7861).
- "Miracle Car Sales" used car lot. The amusing part was the slogan on their sign: "If it's a good one, it's a Miracle." (Dennis K. Miller, 9623). Now out of business, he says. Maybe too few "Miracle cars."
- "Trash Can Café" (Chris Miller, 12640, who says the name stimulated his appetite ... to eat elsewhere.) This reminds me that, when I lived in Texas in the '70s, I used to pass a small café regularly that had a sign advertising "world's worst hamburgers." It aroused my curiosity, but never enough for me to stop and test the claim.

– Larry Perrine (845-8511, MS 0165, lgperri@sandia.gov)

Sandia's US Savings Bond drive nets 67 percent participation

Results of the 2001 US Savings Bond campaign indicate that Sandians continue to buy savings bonds despite the low national savings rate. According to Jerry Chavez, Area Manager of the US Savings Bond Marketing Office, "The US savings rate is negative, and comparable to the rate not seen since the depression."

Sixty-seven percent of Sandia employees (nearly 5,000) are purchasing US Savings Bonds this year. Since this time last year, Sandia employees have bought \$2,606,000 worth of bonds (42,833 purchases) through the payroll savings plan and as individual purchases. By the end of the bond drive, there were 400 new buyers and buyers who decided to increase their bond purchases.

"We're one of the top companies in the Lockheed Martin family in percentage of participation for a company our size," says Juanita Sanchez (12660), Sandia's Labs-wide Savings Bond project leader. Nationwide, Lockheed Martin is second after Johnson & Johnson.

"Sandia has consistently received the US Treasury Department's Savings Bond Honor Roll Award," says Juanita. "I feel very proud of the continued support of the bond program here at Sandia. We're the only national laboratory to achieve a leadership role in employee participation."

Sandia's savings bond campaign ran May 21 through June 1. Although the campaign is over, employees may sign up for the payroll deduction plan any time of the year. Contact the Sandia Payroll Department to sign up for payroll deduction. The Treasury Department's Bureau of the Public Debt has a Web site that provides all kinds of information about US Savings Bonds. Check it out at <http://www.savingsbonds.gov>. (See also "Lockheed Martin donates drawing prizes" below.)

"We're one of the top companies in the Lockheed Martin family in percentage of participation for a company our size."

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Lockheed Martin donates drawing prizes

Savings bonds, piggy banks, and candy jars: Who won

Here are the winners of the \$50 Series EE US Savings Bonds donated by Lockheed Martin and other drawing prizes in this year's bond drive (above right). All current and new bond participants were eligible to participate.

"We are pleased Lockheed Martin Technology Services again chose to support our Savings Bond Campaign with these bonds," says Don Carson, Director of Public Relations and Communications Center 12600, who is responsible for Sandia's bond campaign. "The bond drawings are a nice way to generate interest in the campaign and to attract new buyers. I thank Mike Camardo and Lockheed Martin for their generosity."

Winners of the \$50 Series US Savings Bonds:
Leonard Torrison (1630), Gary Pena (1643), Keith Matzen (1670), Diane Botwinski (1701), Joanne Hertz (1710), Ronald Jones (1741), Peter Esherick (1744), James Schwank (1762), William Warren (1802), Kenneth Gillen (1811), Neil Sorensen (1832), Ronald Hartwig (2100), Edward Talbot (2254), Greg Haschke (2344), Paul Butler (2522), John Merson (2552), Robert Arnot (2561), Sheila Black-Ormond (2913), David Westgate (2951), William Boyer (2952), Vanessa Miles (2955), Kimberly Haulenbeek (2992), Anthony Trujillo (2994), Gloria Atencio (3053), Valerie Mascarenas (3341), Geraldine Herrera (50001), Kenneth Insch (5323), Laverne Romesberg (5323), Michael Vannoni (5324), Paul Rexroth (5326), Mark Grohman (5326), Dawn Dickerson (5329), David Bullington (5713), Rebecca Horton (5848), Cynthia Acosta (6001), David Bronowski (6117), James Moreno (6216), Sheila Nelson (6501), Dianne Barton

(6515), Richard Chapman (6524), Julian Bartlett (6525), Susan Moore (6536), Paul Shoemaker (6820), Ina Frazier (7100), Donald Joe (7122), Danielle Nieto (7131), Willie Johns (7140), William Kitsos (7810), Mary Alice Padilla (7826), Shirley Mayer (7826), Charles Mueller (8362), Charles Schmitz (8419-2), Linda Groves (8114), Steven Haney (8731), Barbara Troen (8528), Deanna Dicker (8516), Robert Chan (8416), Troy Delano (8114), Barry Boughton (9116), David Clauss (9125), Mike McConkey (9224), Timothy Spears (9334), Robert Parks (9512), Tobias Barros (9623), Beverly Ortiz (9624), Kim Mitchiner (9800), Thomas Bomber (9811), Helen Srader (9904), Wanda Bechdel (10003), Jennifer Lovato (10268-4), Erlinda Silva-Sweeney (10253), Douglas Otts (10255), Bonnie Apodaca (10500), James Chavez (12100), Timothy Petersen (12334), Patricia Nitschke (12820), Judy Cardenas (14000), James Clinch (14004), Judith Ruffner (14172), Daniel Rondeau (15003), David Kozlowski (15272), Phillip Coleman (15331), Corey Cook (15426), Edwina Kiro (3022), and Sharon O'Conner (6862)

Winners of the piggy bank and candy jar giveaways: Eugene Venturini (1122), Michael Cuneo (1673), Richard Wavrik (1745), Walter Olson (1846), Douglas Weiss (2333), Claudia Lokinski (2993), Juan Abeyta (3031), Alan Armentrout (3051), Genevieve Corona (5736), Eric Lindgren (6131), Duane Carr (07140), Paul Schlavin (7824), Richard Toledo (7843-2), David Nagel (8935), Jaime Castaneda (09112), Reyna Skeets (10508), David Klassen (12300), Donald Bahrs (141814), Richard Hay (15419), Linda Schalles (3052), and Cecelia Williams (6803).

Doctoral candidate at Sandia/California wins prestigious research prize at annual international Physical Electronics Conference

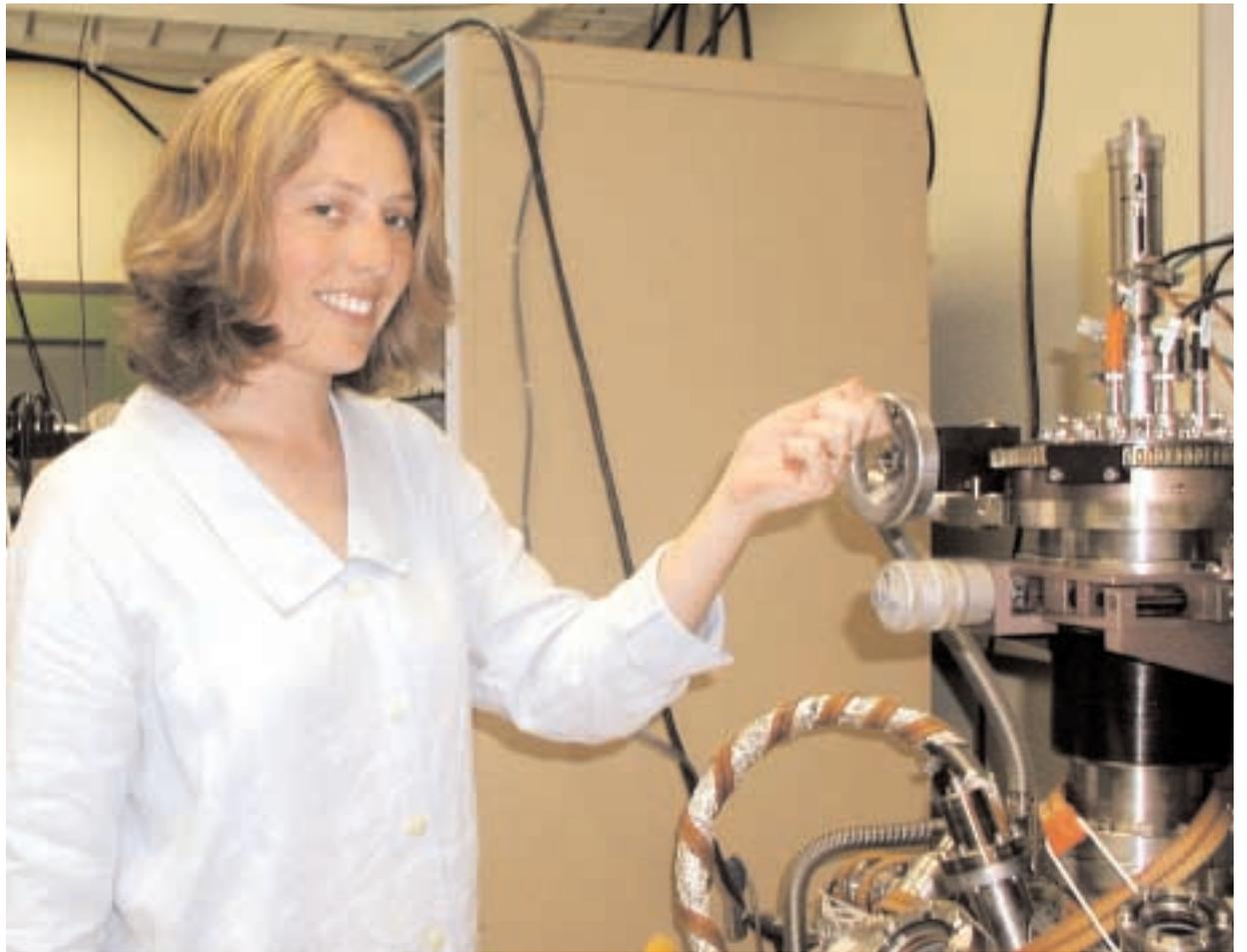
By Lindsey Sancrant

Gayle Thayer (8721), a doctoral student at UC-Davis who has worked two years in Sandia's Student-Employee Research Fellowship Program, has won the prestigious \$1,000 Nottingham Prize at the 61st international Physical Electronics Conference for her paper on surface science research conducted at Sandia.

Gayle's paper about the formation of self-organizing nano-structures, "Linking Stress to Structure using STM," was presented June

12 at Taos, N.M., at the conference, which was co-sponsored by Sandia/New Mexico. Using scanning tunneling microscopy (STM), Gayle was able to measure the strain of stressed surface areas (due to lattice mismatch) of thin films of silver-cobalt alloy deposited on ruthenium. The research has implications for microelectronics, she says, and the award — bestowed annually for the last 35 years — has a legacy of successful past winners: Ward Plummer, Henry Weinberg, Torgny Gustafsson, Wilson Ho, Ruud Tromp, Joost Frenken, and

Two Sandia/California projects receive highly regarded R&D 100 Awards. See Chris Burroughs' story beginning on page 1.



NOTTINGHAM WINNER — Gayle Thayer (8721) has won the coveted \$1,000 Nottingham Prize at the 61st international Physical Electronics Conference. (Photo by Vivien Cheung)

Sandia CaliforniaNews

Brian Swartzentruber, to name a few.

Although the Physical Electronics Conference is held as a forum for professionals to present their research, a special session was held for graduate students in the form of the Nottingham Prize, established in memory of Professor Wayne B. Nottingham of Massachusetts Institute of Technology. Although anyone can send in work, including international participants, only nine papers were selected for presentation, including Gayle's.

A graduate student at the physics department of the University of California-Davis, Gayle launched her research in June 1996 under Professor Shirley Chiang. Three years later, Gayle continued her PhD thesis research at Sandia with Bob Hwang (8721) in the Thin Film and Interface Science group through the Student-Employee Research Fellowship. Although a PhD thesis takes an average of up to six years in the United States, Gayle was able to complete her research in only five years due to the

advanced equipment and mentors at Sandia.

On her visit to the Sandia/California site, Gayle said she was impressed by not only the facility, but by the site's ability to connect experimental results to theories. In fact, the edge on winning the Nottingham Prize was due to Gayle's ability to illustrate theories and calculations that supported her experimental research, the same procedure that first excited Gayle to join the Thin Film and Interface Science group through Sandia's Student-

Employee Research Fellowship.

In addition, Gayle credits her success to group effort, especially to Andreas Schmid, a former Sandia employee who helped her launch the experimental side of the research, and Norm Bartelt (8721) who guided her through theoretical applications.

Currently Gayle's plans include a thesis on the role of stress in metal hetero-epitaxy and a post-doctoral position at the IBM Thomas J. Watson Research Center.

The two-year position is a collaboration between Sandia and IBM and will require Gayle and her husband to relocate to New York. Her mentor at IBM will be Jim Hannon, who once held a postdoctoral position at Sandia/New Mexico.

Nina Berry's mentoring earns recognition in Washington, D.C.

Researcher Nina Berry (8920), the mentor for scores of College Cyber Defenders students who learn information protection in a structured internship (*Lab News*, July 13), received a special honor this month.

Nina has received a Women of Color Technology Award in Government and Defense for Educational Leadership in Government.

The award was presented July 20 in Washington, D.C., by the Career Communications Group Inc., publishers of *US Black Engineer & Information Technology*, *Hispanic Engineer & Information Technology*, and *Count Me In*, as well as producers of two TV series, "A Salute to Black Leadership," and "A Salute to Hispanic Excellence."

Tyrone Taborn, chairman, CEO, and publisher, wrote to Nina that her award highlights for many young women "the vastness of opportunities that await them. You are the star, showing them a path . . .

Because of you, many other stars will be born, and the light you have created will never be extinguished."

Nina received her doctorate in industrial engineering from Pennsylvania State University and came to work at Sandia in 1997, where she researches software entities known as intelligent agents. She graduated with honors in computer and information science from Mary Washington College, and received several fellowships, research awards, and scholarships during her academic training. In addition to her numerous publications, she chairs a standards committee for the Foundation for Intelligent Physical Agents.

"You are the star, showing them a path . . . Because of you, many other stars will be born, and the light you have created will never be extinguished."



NINA BERRY (8920), left, mentoring College Cyber Defender student interns.

— Nancy Garcia

R&D 100

(Continued from page 1)

submitted jointly by Sandia and Staib, the company currently manufacturing the microscope.

Barney says that unlike earlier microscopy systems, one version of the IEEM — the alpha-source IEEM — doesn't even use an accelerator.

"It replaces a building full of expensive accelerator and nuclear microfocusing equipment with a device the size of a scanning electron microscope," Barney says. "It will also be a fraction of the cost of a conventional nuclear microprobe."

The low cost and size comes at no reduction in capability and even enables for the first time some experiments using accelerators, which were previously considered unsuitable for nuclear microscopy.

Barney speculates that this development "could well lead to a renaissance in nuclear microscopy, particularly for studying electron transport in semiconductors and microelectronics and for radiobiology research."

Instead of focusing high-energy ions like the Hybrid Nuclear Microscopy System (*Lab News*, Sept. 22, 2000), which has been the standard form of locating problem areas in radiation-hardened integrated circuits for the past decade, the IEEM technique determines the position where an individual ion enters the surface of the sample by projection secondary electron emission. These position signals are then correlated with the ion-induced signal generated in the sample or device under test.

The IEEM comes in two forms, one using a particle accelerator, and one using a radioactive alpha particle source.

"The main advantage of the accelerator-IEEM over commercial focused beam nuclear microprobes is the low-cost and small size, even after it is integrated into a beam," he says. "The IEEM system will also allow us to perform Radiation Effects Microscopy using the highly ionizing beams from the Radio Frequency Quadrupole linac booster recently added to the tandem accelerator in the Ion Beam Materials Research Lab in Bldg. 884.

"For the alpha-IEEM, future prospects are equally exciting because no accelerator is required — just an alpha-particle source deposited on the objective aperture. The cost for the complete system is \$100,000, compared to the multimillion dollar system for focused microbeams, which require accelerators," Barney says.

Polymer Hydrogen Getters

Tim Shepodd (8722), co-inventor of the polymer hydrogen getters (*Lab News*, May 5, 2000), calls the product the "greatest advance in getters in 50 years."

The getters permanently and irreversibly remove unwanted hydrogen and, as a result, can prevent explosions caused by hydrogen mixing with the atmosphere in sealed consumer products and avert hydrogen buildup that can result in a decrease of insulation properties or loss of efficiency in evacuated heat exchangers.

Tim and LeRoy Whinnery (8722) of Sandia/California are receiving the R&D 100 award for inventing the polymer hydrogen getters.



TIM SHEPODD (8722), co-inventor of the polymer hydrogen getters, calls the product the "greatest advance in getters in 50 years." The technology has won an R&D 100 Award. (Photo by Lynda Hadley)

"Our getters allow the safe use of sealed, battery-operated devices such as flashlights, dive-lights, toys, and cameras without the risk of inadvertent detonation," Tim says.

It is long known that alkali and carbon/zinc batteries give off hydrogen. In unsealed devices, the hydrogen poses little danger because it is rapidly diffused. Batteries in sealed devices, however, easily yield sufficient hydrogen to create an atmosphere if over-drained, charged, or inverted.

The polymer hydrogen getters function in two ways. They either scavenge hydrogen with carbon-carbon multiple bonds, or, when oxygen is present, safely make water through recombination. The Sandia getters are customized for each customer, made from readily available ingredients, nonhazardous, and designed to remove hydrogen in a variety of atmospheres, including vacuum, inert, air, or steam.

"Polymer hydrogen getters are a spectacular example of an enabling technology," Tim says. "They are deployed as a small, passive part of numerous technologies and are usually less than one percent of the mass and cost. Yet without getters, the entire technology may not be able to be safely or economically deployed. A flashlight that explodes, a camera that could malfunction or explode — these consumer products are made safe by our technology."

Sandia's polymer hydrogen getters are currently marketed under a licensing agreement with Vacuum Energy Inc. of Cleveland, Ohio.

Solid-State Radiation Detectors

Detection and imaging of nuclear materials, such as radiotracers in nuclear medicine, just got easier. The reason is a new technique of growing large single crystals of cadmium zinc telluride (CZT) suitable for producing radiation detectors. The technique was developed by a team of researchers from Sandia/California; Yinnel-Tech Inc. in South Bend, Ind.; Techion — Israel Institute of Technology; and Fisk University.

"Progress in the area of solid-state X-ray and gamma-ray detectors has been linked to producing better crystals. Our discovery of a technique to grow large single crystals of CZT with the desired electrical properties has begun to transform the technology area, creating new thrusts and directions for solid-state radiation sensors and imaging arrays," says Ralph James, who served as the Sandia principal investigator for the project. He left the Labs this spring to join Brookhaven National Laboratory as Associate Laboratory Director.

The solid-state radiation detectors based on semiconductor materials made from cadmium zinc telluride are unique because they can operate at room temperature, detect X- and gamma-ray radiation with high efficiency, and uniquely identify the isotopes responsible for the emitted radiation.

The team's development of an improved technique to grow detector-grade CZT crystals and a new method to reduce the dark current flowing along the crystal surfaces have allowed for major improvements in the signal-to-noise ratio, long-term stability, and yield of single-crystal material.

Ralph says the detectors have diverse applications, ranging from environmental cleanup, imaging of gamma-ray bursts, radiography, and safeguarding the world's inventory of nuclear materials to improved detection of tumors and heart disease.

Before the team developed the new technique, a detector capable of distinguishing natural background emanating from common building materials and the radiation characteristics of many isotopes relied on bulky equipment that had to be cooled to super-low temperatures and attended frequently by a technician. Preparing the equipment for use required precooling for a few hours.

Radiation detectors produced from these new materials need no cooling, are easy to use, require little or no maintenance, and provide the capability to identify radioactive sources in the field, Ralph says.

CZT detectors had been produced using other growth techniques, but the low yield of large-volume single crystals limited the detectors' efficiency and availability and led to costs that were prohibitively high for several applications. The cost reduction for large, single crystals of CZT has enabled a more widespread use, particularly for imaging applications.

Team members from Sandia included Eilene Cross (8517), Jay Erickson (former student intern), Richard Olsen (8724), Gomez Wright (former student intern), and Walter Yao (now at Advanced Micro Devices, Inc.).

FY02 Raises

(Continued from page 1)

what the annual performance review process is all about.

Sandia must demonstrate that — on the whole, looking across the Labs — employees with OC ratings, that is, "Outstanding Contribution" ratings, will collectively receive higher percentage raises than employees with an FC, or Full Contribution, rating. The OC rating is limited by Labs policy to no more than 25 percent of all the employees in a particular job classification in a given division. The presumption is that the vast majority of the other 75 percent of Sandians will earn the FC rating. A third rating category, the NF (Not fully contributing) rating replaces the old U and E-minus ratings.

In the hypothetical case, the OC-rated widget workers, on the whole, would receive higher

compensation than the FC workers would receive; they, in turn, would see larger percentage increases than the NF-rated employees.

In her remarks, Karen noted that the Sandia compensation increase package is tied to the outside market. The Labs' compensation team does apples-to-apples market comparisons (that is, each job classification in the Labs is compared to similar job classifications in the marketplace) to determine the annual compensation increase. (Sandia subscribes to several benchmark survey providers to assist in its market analysis.)

It was on the basis of market benchmarking — backed by data resulting from a concentrated look at this classification — that the need for a larger increase for tech managers was called for in FY02.

Karen said the annual performance compensation review meetings between staff and managers should occur "in the August timeframe."

At that time, managers will discuss the employee's contributions, convey pertinent customer feedback, and tell the employee his or her VOC (value of contribution) rating.

Subsequently, sometime in September, each employee will receive a compensation notice; that individualized note details the employee's raise and any non-base award. In addition, it will have two ratios: One will show a comparison between the employee's base salary and the average salary of others in the same level (i.e., MTS, TNG, PMLS, etc.) Labs-wide. Another ratio will show how the employee's base salary compares to benchmarked outside companies.

In remarks following Karen's presentation, HR Div. 3000 VP Don Blanton said he is "really proud" of the FY02 compensation package. Citing the substantial increases in store for the tech manager job classification, as well as the sensitivity to the market in other classifications he said, "I think we're focusing in the right areas."

Nuclear power

(Continued from page 1)

risk assessments (PRAs) for nuclear reactors for the NRC since the mid-1970s, is using that experience to help the agency revise decades-old regulations following a risk-informed regulatory approach.

Risk-informed regulation combines the results from PRAs with sound engineering practices to develop regulations that ensure a cost-effective approach to safety.

"The risk-informed approach allows the NRC to relax requirements that aren't important and focus on those that are," says Allen Camp, Manager of Risk, Reliability, and Modeling Group 6410. "After 20 years of research, we've gained a clearer understanding of how accidents begin and progress. We know better which requirements make a plant safe — those that prevent or mitigate accidents — and which ones don't."

The NRC has established goals stating that nuclear power plant operation should not expose the public to significant additional risk. PRAs have given the NRC considerable evidence to show that these goals are generally being met, indicating that nuclear energy continues to be a very safe method of generating electricity.

Over the years, PRAs have shown areas where the plants needed to be improved, and also areas where NRC regulations may require unwarranted conservatism.

Risk-informed alternatives

A risk-informed alternative to an existing regulation may eliminate or modify some requirements while imposing others. An important goal of risk-informed regulation is to use risk information to provide flexibility in plant operation and design, which can reduce construction and operating costs while enhancing safety.

In the early days of nuclear power plants — and then even more so after the Three Mile Island accident — the NRC regulations became extremely prescriptive, building many safety layers into the plant design. For example, the Three Mile Island accident raised concerns about the potential for ignition of hydrogen gas generated during an accident.

To address this concern, the NRC imposed new requirements to help prevent hydrogen combustion from becoming a problem in an operating plant. Later analyses showed that some power plant designs did not need all of these requirements.

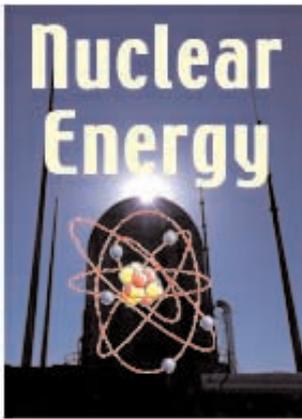
"It wasn't unusual for plant operators to spend training time preparing for a variety of extremely unlikely accidents instead of events that pose a much more real threat to the public," Allen says. "This is completely counter to safety."

Tom Sanders, Manager of Nuclear Initiatives Dept. 6406, says the NRC turned to Sandia to assist with risk-informed alternatives to regulations because of "its experience in risk assessment and severe accident analysis for nuclear power plants."

Unrealistic conservatism?

Over the past two decades, Labs personnel have visited many plants and built an understanding of their operations as part of nuclear power risk assessment activities. Sandia provides a unique perspective to the NRC on how the regulations affect nuclear power safety.

"The Labs' role has been helping the NRC to figure out which parts of the regulations



must stay, and which ones can be modified, and how to modify them," Tom says.

For example, Sandia is currently involved in identifying risk-informed alternatives to the regulations for emergency core cooling.

Emergency core cooling systems provide cooling water in a light water reactor in the event of a pipe break or other loss of coolant accident. Current regulations, which were developed in the early 1970s, require these systems to begin delivering water within seconds of a large pipe break, and to prevent core damage despite major failures within the system.

"The risk-informed approach allows the NRC to relax requirements that aren't important and focus on those that are."

More recent risk information has shown several ways in which the methods used to evaluate these systems were unrealistically conservative. Reducing these conservatisms allows for more realistic training and testing of equipment, thus enhancing safety. According to Jeff LaChance (6410), changing these regulations could save the nuclear industry, and thus consumers of electricity, \$1 billion or more because plants could operate at increased power levels even while reducing operating costs.

Current NRC regulations

The current NRC regulations were developed for light water reactors, such as those now in operation in the US. However, Sandia is working to bring the same risk-informed approaches to regulating advanced reactor designs being developed by the nuclear industry and DOE.

Risk-informed approaches have an even greater potential for savings in advanced reactors, because significant improvements can be made in the initial designs.

Sandia is supporting DOE's Nuclear Energy Research Initiative as part of an industry/university/national laboratory team to develop risk-informed approaches for advanced designs.

The NRC is now preparing to regulate advanced reactor designs. Several companies have approached the NRC about the certification and licensing of new reactor designs.

Exelon Generation Co. is considering an application for a site permit during 2002, and several additional site permit applications are expected to follow. The type of reactor

Exelon plans is a pebble bed modular reactor (PBMR) — as opposed to the light water reactor. Licensing for the PBMR will involve the use of risk information to adapt the current regulatory process to their design.

"Because no pebble bed reactors have ever been built in the US, the NRC does not have regulations to govern their design, construction, and operation," says Greg Wyss (6410). "While the first PBMR license will probably use a modified version of the current regulations, the NRC will likely develop completely new regulations for future reactors. And Sandia will help guide them in a risk-informed approach."

Given the initial successes of risk-informed regulation with the NRC, Sandia sees the potential for many other applications of these approaches, Tom says. Essentially any regulated industry or operation can make use of these ideas. For example, the new risk-informed regulations may include guidelines for recycling waste from the nuclear fuel cycle. Assessment of proliferation risk and development of related regulatory guidelines may also be possible.

Allen says the changes to the NRC regulatory process are proceeding and major changes for future reactors will happen over the next few years.

"The technical basis for this approach has been developed, and the NRC continues to be a leader among federal agencies in implementing risk-informed processes," Allen says.

Light water reactor vs. pebble bed

All nuclear power reactors in the US today are light water reactors. Hence, Nuclear Regulatory Commission (NRC) regulations are based on this type of reactor.

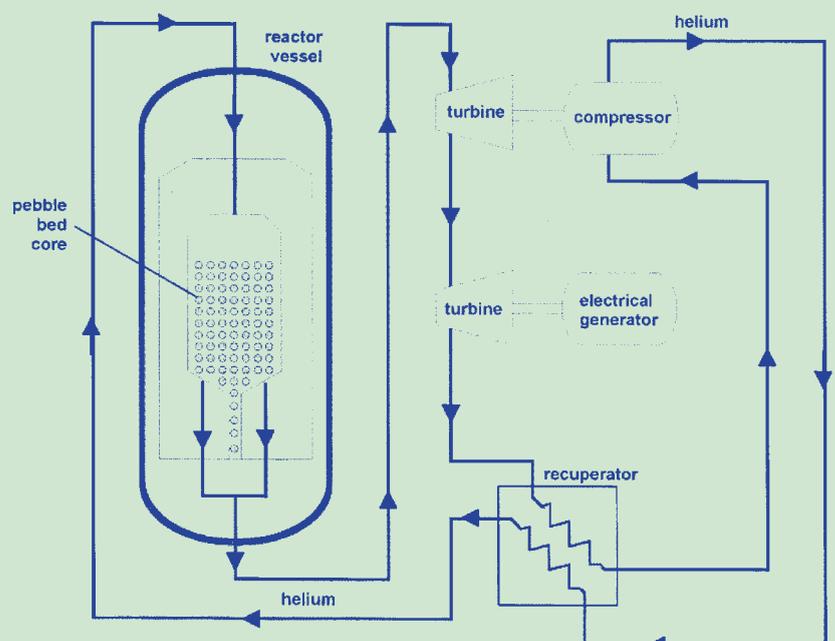
Exelon Generation Co. is proposing to build a different type of reactor called a pebble bed modular reactor. This reactor was originally developed in Germany.

In the light water reactor, long thin metal rods containing uranium serve as fuel. The rods are placed in a large steel pressure vessel. Water flows into the pressure vessel, where it circulates around the metal rods (but does not come in contact with the uranium) and is heated to very high temperatures. The heated water is then used to create steam that drives a turbine, which produces electricity.

Instead of using rods and water, the pebble bed reactor contains many small balls of uranium and carbon compounds. Pipes pump in helium that flows around the balls to remove heat. The heated helium flows out of the reactor and through a heat exchanger to create steam and produce electricity.

Because pebble bed reactors use more passive emergency heat removal systems and contain materials that are resistant to higher temperatures, they are believed to be more resistant to meltdowns than light water reactors.

Schematic of Pebble Bed Modular Reactor



Rep. Wilson thanks Sandians for energy work; calls for balanced approach to energy policy

By Bill Murphy

Rep. Heather Wilson, R-N.M., came to Sandia last week to say “thanks” to Labs employees for the work they’ve done over the years to help build America’s energy security and to talk to Sandians, community leaders, and news reporters about the need for a balanced national energy policy.

Her visit to Sandia’s National Solar Thermal Test Facility was part of a coordinated nationwide “day of energy awareness” on July 16. The day was organized by Vice President Dick Cheney, who conducted an energy-related town hall meeting in Philadelphia. In addition to Wilson, at least 25 other GOP members of Congress held similar sessions in districts across the country.

Wilson said emphatically that the US House of Representatives will pass a national energy plan this year, one that takes a balanced approach to energy issues.

“We have a serious energy problem [in the US],” she said, adding that the issue long ago should have been given more attention by policy-makers. “The silver lining of problems,” she added, “is that they cause people to focus.”

Recently, Wilson helped pass a bipartisan national energy plan in the House Energy and Air Quality Subcommittee. The bill includes provisions on energy conservation, renewable energy, clean coal technology, nuclear energy production, and advances in hydropower production.

In a Wilson-introduced amendment to the bill, the national laboratories will conduct a national assessment of renewable energy resources. Wilson also sponsored amendments to extend federal renewable R&D and strengthen nuclear energy programs.

In recent months, Wilson has emerged as a key Republican representative on energy policy matters. She was named by House GOP leadership to the 20-member House Energy Action Team (HEAT), which spearheads energy legisla-



CRAIG TYNER (6216, right), Manager of Solar Thermal Technology Dept. 6216, explains some of Sandia’s solar energy R&D resources to Rep. Heather Wilson, R-N.M., during a July 16 visit by the congresswoman to the National Solar Thermal Test Facility at Sandia. With Wilson is Labs President C. Paul Robinson.

tion in the US House of Representatives. She is a member of the House Energy and Commerce Committee, which has jurisdiction over energy policy. Wilson is a close political ally of Sen. Pete Domenici, R-N.M., widely recognized as one of the nation’s key champions for nuclear energy and for a vibrant role for Sandia and other national labs in energy R&D.

Indeed, during her visit to Sandia, Wilson said she expects that Sandia’s long record of involvement with energy research “will be even stronger in the years ahead.”

Wilson spoke about the need for the nation to take a new look at nuclear energy, which has

been the stepchild of the energy industry for most of a generation.

“It’s time to re-think our position,” she said. “Nuclear energy is safe, it’s reliable, and it can help us reduce our reliance on foreign sources of energy.”

Wilson spelled out what she views as “the bottom line” regarding energy supply in the US.

We want an energy policy, she said, that “allows us to flip a switch and have the lights come on. We want a gasoline supply where the prices are not exorbitant. . . and we want an energy supply that allows us to enjoy and protect our environment.

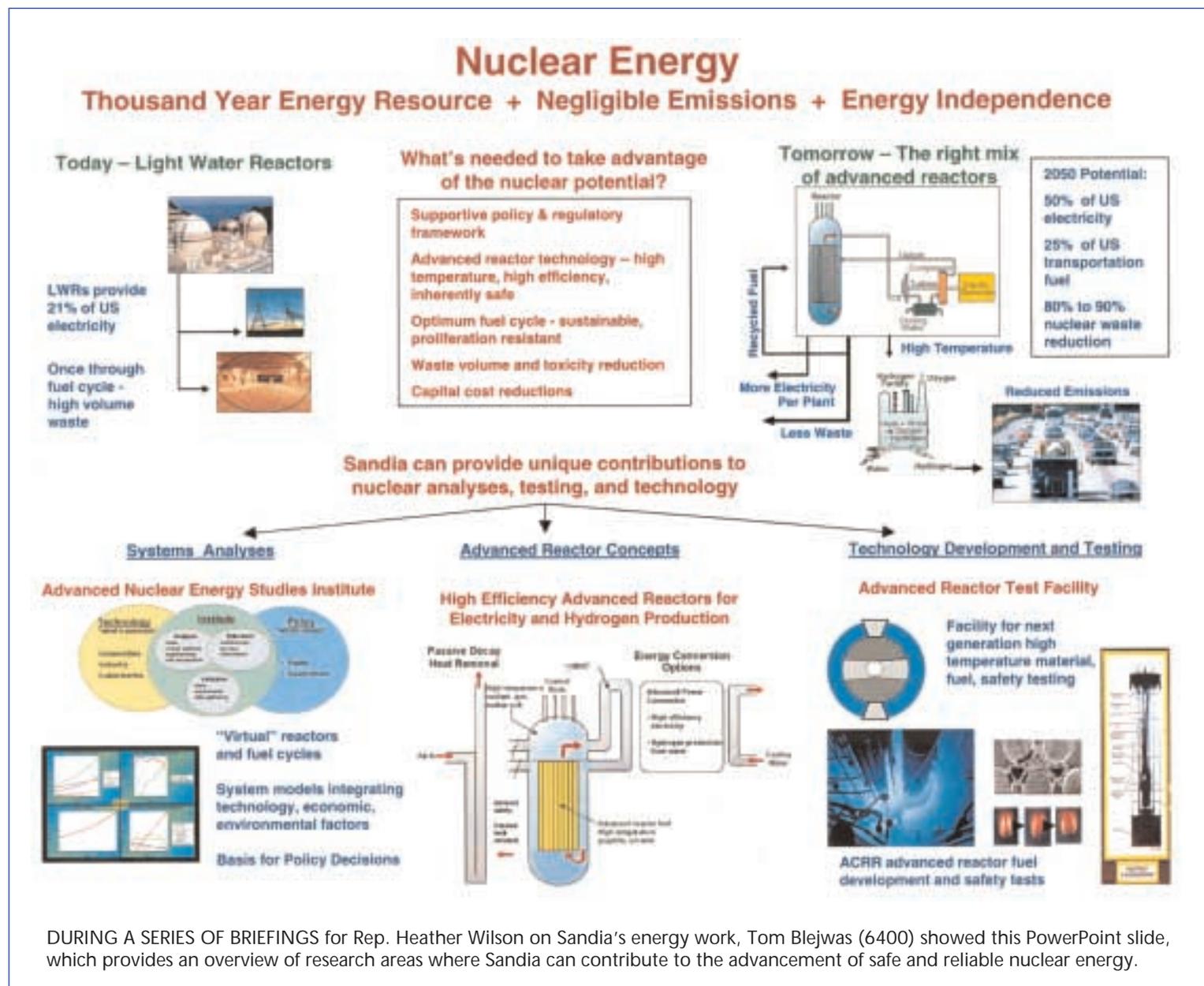
“We can achieve these goals with a balanced long-term approach,” she said.

Prior to her comments, Wilson heard Sandia President Paul Robinson note that Sandia is “the total energy portfolio laboratory,” with a history of work in fossil fuel R&D, conservation, renewables, nuclear energy, and supply surety.

Sandia chief economist Arnie Baker (6002) shared with Wilson a computer model tool, PowerSim, that allows the user to see the relationship between energy supply policy decisions and greenhouse gases. The software, while robust enough to be a useful learning tool, is compact enough to run on a laptop PC.

Sandia Energy Div. 6000 VP Bob Eagan welcomed Wilson “on behalf of the 900 people at Sandia who work in energy,” providing her with an overview of some of the many research areas his division is involved in.

Following her remarks, Wilson received more detailed briefings from a number of Sandians about specific energy-related projects.



DURING A SERIES OF BRIEFINGS for Rep. Heather Wilson on Sandia’s energy work, Tom Blejwas (6400) showed this PowerPoint slide, which provides an overview of research areas where Sandia can contribute to the advancement of safe and reliable nuclear energy.

Sandia intern will represent New Mexico at annual Miss America pageant in September

Her platform: She champions the blessings of living in a free society

By Bill Murphy

Here's an insight into what makes Marta Strzyzewski tick: The first piece of furniture her parents bought when they arrived in the US from Communist-dominated Poland during the height of the Cold War was — a piano.

Marta, a student intern in Computational Initiatives Dept. 15311, recently won the 2001 Miss New Mexico pageant. That means she'll be competing for the Miss America title in Atlantic City this September (it is televised on Sept. 22). As her talent, she'll be playing the piano, a demanding Chopin piece called the "Revolutionary Etude."

Marta (her last name is pronounced *shtra-ZHEF-ski*) was born in Warsaw. She came to Roswell in 1984 at age six. Her father was active in the Solidarity Movement, working shoulder to shoulder with Lech Walesa and others to restore democracy and economic prosperity to the beleaguered Eastern European nation. When the Soviets and their Polish proxies clamped down on the increasingly popular and effective Solidarity Movement in the early 1980s, Marta's parents decided it was time to escape the repressive regime.



MARTA Strzyzewski as Miss New Mexico 2001.

Marta's dad escaped to the US first while her mom waited to give birth to Marta's brother before flying overseas. Unfortunately, martial law was imposed a few days after her father left, and the family ended up being separated for two years. Her dad found a job in Roswell first working at St. Mary's Hospital and then settling at the TMC bus manufacturing plant. After the borders reopened in Poland, her mother, brother, and Marta were reunited with her father, thanks to a lot of help from his TMC coworkers and Sen. Jeff Bingaman's office.

Dad 'needed freedom'

"He [her father] didn't want us to be unsafe. And he needed the freedom," says Marta, with just a hint of an accent that suggests English wasn't, after all, her first language.

Marta says her parents have never looked back. "They're always really happy that they actually live here. Even when they go back — the conditions are a lot better and Poland is growing economically and becoming a better country — but even when they get to go back and visit they're still so happy to come back home to America."

As for Marta, she feels like a native New Mexican. "I started kindergarten here in the US. I grew up in Roswell, and all my friends were there."

After graduating from Roswell High School, where she was an honors student "involved in every school club imaginable," Marta faced the same challenge that every good student faces: where to go to college. She applied to a number of schools both in state and elsewhere, including, on a whim, the New Mexico Military Institute in her hometown. (NMMI offers a junior college program in addition to its better-known high school program.)

"I just wanted to see if I could get into a military school. I thought it would be helpful in case I decided to go to the Air Force Academy. When I got in [to NMMI] on a full ride, I said, 'Wow, this is absolutely incredible.'"

That full scholarship — and a desire not to be a financial burden on her family — counted for a lot in Marta's decision to don a cadet's uniform and go to a military school. She's glad she did.

"It was a blast. I had a great time. I made so many friends and got such a good education."

Marta, who has decided on a career in neurological research, completed her basics (calculus, English, and other subjects) during two years at

NMMI, before transferring to the University of New Mexico, where she graduated in May with a degree in biology.

Her original intent was to go on to med school, but along the way, she "fell in love with lab work and research" and decided to focus her education in that direction. (As a result of volunteer work at Carrie Tingley Children's Hospital, she's become particularly interested in research aimed at spurring regrowth of neurons, with the hope that someday many victims of paralysis may be able to walk again.)

Though they're Americans through and through, Marta's parents brought a bit of Old World sophistication to Roswell. Marta's mom owns the "Taste of Europe" restaurant there, and then, of course, there was the piano, which had a special meaning for the family.

"My mom loved the piano, but she never got the opportunity to play, because in Poland everything was so expensive. It meant a lot to her to give her kids an opportunity she never had."

Marta began piano lessons at age seven, and took dance lessons as well. She underwent surgery for scoliosis at age 12, and although she recovered quickly, her flexibility was never again quite what it should be, and she gave up dance at about age 15 to concentrate exclusively on the piano.

Overcoming shyness

Marta first forayed into the pageant world not long after her back surgery. As she tells it, her mother thought she needed to get involved in something that would help her overcome her natural shyness and boost her self-confidence. The pageant track did the trick. "It really helped a lot," she says.

Not that her mom was a stage mother or anything. "Not at all. I mean, she started me in it. She said, 'Whatever you want to do, you do; if you don't want to do it, you don't have to.' She was like that with my dancing and piano, too."

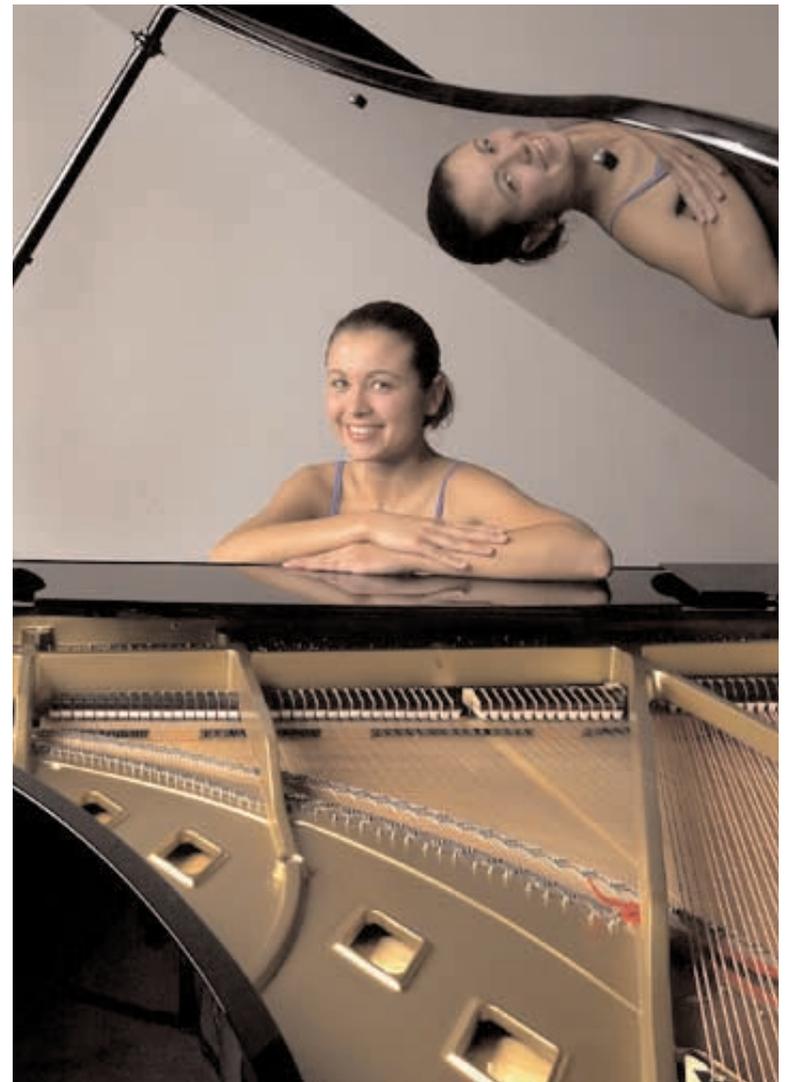
As a young teen, Marta competed in Cinderella pageants, a sort of warm-up for Miss America for younger girls. Ultimately, she finished in the top 10 in the teen category of the International Cinderella pageant in Oklahoma City, and then competed in 1998 for the Miss New Mexico title. She stayed out of the pageant for a couple of years, before making a grand comeback to win the state crown this year.

As a very smart young woman with ambitions to earn a doctorate in a hard science, how does she feel about participating in a beauty pageant?

"I don't look at it that way," Marta says. "I understand that some people look at the Miss America competition and think of it as a beauty pageant. If you don't know about something, you



MISS NEW MEXICO 2001 and Sandia intern Marta Strzyzewski practices Chopin's "Revolutionary Etude" in preparation for the Miss America pageant in September. (Photo by Randy Montoya)



MARTA Strzyzewski prepares for the talent portion of the 2001 Miss America pageant by practicing on one of the Steinway grand pianos at Washburn Piano Co. in Hoffmantown Shopping Center.

(Photo by Randy Montoya)

tend to make judgments. If I were able to talk to someone and tell them what it's about, it would make more sense to them."

Important points she'd make to skeptics:

- Miss America is a scholarship pageant — a very important consideration for this education-minded woman.

- The competitors don't pay for anything.

- "It gives you an opportunity, if you have something that you strongly believe in, to be able to speak out to the community. You don't always have that opportunity in day-to-day life. I mean, without 'PhD' by your name or 'Senator' in front of it, some people just don't listen to you. So I think the crown is like a microphone and lets you speak out to people and show them what you believe in."

- "The pageant is 40 percent intelligence, which is what you demonstrate in your interview; and it's 30 percent based on talent, so they're not just looking at the beauty aspect."

Let freedom ring

A Miss America is expected to have a cause, also known as a platform, and Marta's seems a natural: "Let Freedom Ring: Establishing U.S. Citizenship." Through her platform, she plans to champion the blessings of living in a free society and help refugees and immigrants from other countries feel welcome and at home in America. This issue has a special meaning for someone whose family had experienced life in a totalitarian regime.

Marta says she isn't going to Atlantic City with any overwhelming sense of destiny.

"I'm not going there thinking that I'm going to win, because, with 50 other women who are just as qualified, I see this as more of a once-in-a-lifetime opportunity and I plan on having a wonderful time while I'm there."

In the meantime, Marta plans to continue working on her platform-related volunteer projects, which she has been doing with Catholic Charities and at Sen. Bingaman's office.

And, she intends to practice that Chopin piece fervently every day between now and September.

Mileposts

New Mexico photos by Iris Aboytes
California photos by Lynda Hadley



Thomas Hinkebein
25 6113



David Hannum
25 5848



Charles Jakowatz
25 5912



Alan Kerstein
25 8351



Ken Lee
25 8725



Russ Miller
25 8401



Michael Sharp
25 6531



Barry Schwartz
25 7101



Michael Thomas
25 6218



Thomas Ashwill
20 6214



Gerald Hash
20 1762



Daniel Horschel
20 6233



Michael Johnson
20 5931



Kathleen Marder
20 5951



Michael Mazarakis
20 1644



Marc Miller
20 9336



Marlene Smith
20 2000



Mark Blanford
15 9142



Edwin Duckett
15 1738



Kim Mitchiner
15 9800



Garth Reese
15 9142



David Sawayda
15 2523



Herb Pitts
40 9600



Charles Warren
30 2346



Erskine Burns
25 2541



Bruce Dale
25 12112

Recent Patents

Roy Baty (2131) and Mark Vaughn (15252): Method for Simulating Discontinuous Physical Systems.
 Paul Klarer (12252): Agile Mobility Chassis Design for Robotic All-Terrain Vehicle.
 Jess Wilcoxon (1122): Photo-Oxidation Method Using MoS₂ Nanocluster Materials.
 John Feddema, Gary Fischer, Michael Kuehl, Lisa Marron, Michael Martinez, and Barry Spletzer (all 15211): Hopping Robot.
 Jeffrey Dohner (1749): Method and Apparatus for Actively Controlling a Micro-Scale Flexural Plate Wave Device.
 Barry Spletzer (15211): Load Cell.
 Albert Baca (1742), Guillermo Loubriel (15333), Alan Mar (15333), Harold Hjalmarson (9235), Andrew Allerman (1126), Thomas Zipperian (1740), Martin O'Malley (15333), Wesley Helgeson, Gary Denison (15333), Darwin Brown, Charles Sullivan (1742), Hong Hou, and Fred Zutavern (15333): High Gain Photoconductive Semiconductor Switch Having Tailored Doping Profile Zones.
 Steven Kurtz (1123), Andrew Allerman (1126), John Klem (1742), and Eric Jones (1123): InGaAsN/GaAs Heterojunction in GaAsN Solar Cells.
 David Sandison (2666): Method and Apparatus for Passive Optical Dosimeter Comprising Caged Dye Molecules.
 Mark Grubelich (2554): Diversionary Device.
 Hong Hou, Michael Coltrin (1126), and Kent Choquette (1742): Method of Varying a Characteristic of an Optical Vertical Cavity Structure formed by Metalorganic Vapor Phase Epitaxy.

Sympathy

To John Long (9332), on the death of his mother, Margaret Long, of Lebanon, Kansas, June 24.
 To Pat Gronewald (6141) on the death of his father, Pat Gronewald, in Albuquerque, on May 20.
 To Dorothy Rarick (9623) and Joe Harris (14020) on the death of their mother, Erma Harris, in Albuquerque, July 19.

Recent Retiree



Donna Archuleta
35 3022

Retiree deaths

Charles T. Stewart (age 94)	May 3	Howard F. Burgess (87)	May 18
George L. Dingman (86)	May 5	George G. Shelton (87)	May 20
Robley E. Irvin (95)	May 8	Aaron J. Kint (91)	June 1
Donald W. Gatto (69)	May 10	Irvin L. Moulton (83)	June 2
John H. Morgan (84)	May 14	Elmer White (77)	June 10
Johann W. Besse (69)	May 16	Gene Anderson (76)	June 10
Arthur W. Porter (81)	May 17	Emil J. Steinkraus (75)	June 12
George W. Dyckes (84)	May 18	Raymond A. Leri (75)	June 22

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

MID-SIZE TENNIS RACKET, Wilson String 2 Junior, graphite, excellent condition, \$25 OBO. Wagner, 823-9323.

GLASS DINETTE SET, 5-piece, \$75; sofa sleeper, \$75 OBO. Gallegos, 363-7589, ask for Maria.

FOUR ADMISSION TICKETS to Six Flags Over Texas in Dallas, good for year 2001. \$25 ea. Shiple, 861-1481.

GM NEW VEHICLE VOUCHER, expires 8/1/2002, \$500 value, asking \$300 OBO. Williams, 296-8094.

LAWN MOWER, Yard Machine, 5-hp, 21-in., rear-bagger, practically new, \$115; tri-view medicine cabinet, new, \$60. Hernandez, 899-9080.

LAWN MOWER, 20-in. rotary, \$20; 120-lb. weight set, w/bench, \$50; chrome desk chairs, w/casters, \$20. Linn, 296-3176.

KENMORE APPLIANCES (electric): refrigerator w/ice maker, almond, \$400; washer & dryer, white, \$400; moving, must sell. Filuk, 281-0078.

TWIN BED, w/mattress, laminated opal-oak frame, 3 drawers underneath mattress, \$125. Klavetter, 299-4299.

CAMPER SHELL, off-white, black trim, excellent condition, keys & clamps, fits full-size Dodge bed, \$200 OBO. Crosby, 260-1070.

DINETTE, w/6 chairs, \$45; small metal utility shelves, \$5 ea.; refrigerator (available 8/12), \$100. O'Neal, 796-0896.

MOTORIZED WHEELCHAIR, electric, great deal as it is brand new, never used, \$4,500 (retails \$8,800). Zelnic, 877-1465.

QUALITY FURNITURE: light-oak entertainment center, \$550; new futon/queen mattress, \$450; pine dining table, 4 chairs, \$550. Shirley, 821-4225.

WORD PROCESSOR, Brother Whisper Writer, ink-jet, rarely used, \$125 OBO. Ferrell, 256-2531.

CIRCLE Y WESTERN PLEASURE SADDLE, 14-in. deep suede seat, dark-brown smooth leather, 6 silver conchas, \$550. Veres, 797-4714.

FIBERGLASS LADDER, 24', Type 1A, \$120; 2 suitcases, 2 colors, soft-side Briggs Riley Quality, 26-in., \$35 ea. Moore, 764-8489.

HOLTON TRUMPET T602, good condition, \$300; Yamaha YTS tenor sax, excellent condition, \$800. Lujan, 822-0205.

BALDWIN UPRIGHT CONSOLE PIANO, w/bench, good sound & touch, \$1,195 OBO. McInteer, 296-1656.

ANTIQUE DESK CHAIR, \$75; white wicker chair & stand, \$50; king-size headboard, \$60. Marder, 291-8140.

THIRD SEAT, '88 Suburban, burgundy, great shape, \$340 OBO; brass baby crib, \$1,200 new, asking \$300 OBO. Smith, 298-5868.

TOW-DOLLY, '98 Master Tow, like new, used only 4 times, \$500 (worth more). Towne, 867-8868.

GARAGE SALE, Sat., July 28, near Lomas & Tramway, furniture, mountain bike. Roush 323-7235.

KENT WOOD STOVE, freestanding, \$800 OBO. Lovato, 881-6080.

DRAPES, 2 pr., light beige, 134"W x 82"L, 110"W x 82"L, w/traverse rods, \$75 OBO; miscellaneous aluminum gutters. Luikens, 881-1382.

LEATHER BRIEFCASE w/laptop compartment, \$99 new, asking \$75 OBO; Coleman "Crawdad" 10-ft. boat w/electric trolling motor, marine battery, anchor, & oars, \$400. Miller, 284-2107.

CHERRY WOOD, about 120 board feet, mostly 3.5-in. T&G, some rough cut & misc. pieces, \$100. Van Den Avyle, 898-6474.

KEYBOARD, Yamaha PSR600; Infinity telescope w/accessories; coffee maker; juicer; yogurt maker. Pound, 899-9123.

HONDA SNOW TIRE RIMS, 13-in.; maple furniture, circa 1900-1930; grow-light fluorescent bulbs & lamp; portable workbench. Walker, 294-7538.

MAGNAPLANAR SPEAKERS, \$300; Yamaha 6-CD changer, \$150; Samsung VCR, \$75; all in excellent condition. Petersen, 856-3499.

WEDDING DRESS, size 8/9, champagne satin, off-shoulder cap sleeves, \$200; matching western leather/lace boots, worn once, \$125. Rivers, 720-4701.

ADIDAS SOCCER UNIFORMS, set of 16, blue jersey, white jersey, white shorts, blue socks, white socks. Rector, 286-1217.

YAMAHA ELECTRIC GRAND PIANO, model CP-70, portable, good condition, original owner, \$750 OBO. Collins, 822-0671.

VINYL PICKUP BED COVER, for Toyota T-100, \$75 OBO. Bronkema, 286-0423.

WASHER/DRYER, \$100; lighting fixtures, \$40; cradle, baby carrier, diaper pail, call; miscellaneous computer parts, free. Holzrichter, 298-5695.

FREE FISH, convict cichlids, gray w/black stripes. Leisker, 293-3075.

KENMORE SELF-CLEANING OVEN, \$200; countertop gas range, \$50; both like new, with manuals. Guttman, 888-5114.

CRAFTSMAN LAWN MOWER, 20-in., 4.5-hp, rear-bagger, excellent condition, \$100. Lunt, 898-9501.

RED RACECAR BED, twin, Little Tykes, \$250; Lowry organ, nice, \$125; HP Jet-set color printer. Sanchez, 898-9598.

KITTENS, need good home, very loving, approx. 6-8 wks., 1 white w/Siamese markings, 2 black, 1 gray. Tapia, 292-7043.

COMPUTER DESK, oak, 30" x 68", \$125; dining table, oak, 35" x 59", \$40; filing cabinet, 4-drawer, metal, \$45. Gruebel, 323-2414.

INTREPID COVER, \$15; Nineteen Eleven capper, compact, \$425; 3 folding lawn chairs, steel w/fabric, \$15. Mooney, 294-5161.

SCUBA GEAR, US diver regulator, Scubapro Classic BCD, SUUNTO computer, new Body Glove, hood, tanks, & more. Whittet, 281-2216.

GARAGE SALE: Fri./Sat., Aug. 3/4, 8 a.m.-1 p.m., 9215 Meriwether NE (Heritage East), baby crib, toys, household, clothes. Williams, 797-8912.

WATERBED MATTRESS, extra-firm king, 4 yrs. old, \$125 OBO; 2 radial tires, P205/75R14, \$50 for both. Zirzow, 281-9896.

FIVE-STAR RESORT VACATION WEEK(S), anywhere in the world, check at www.intervalworld.com, available until next May, \$700/week. Givens, 292-2058.

MINIATURE PINSCHERS, AKC, black/rust females, nine weeks, shots/tails done, need good home(s) w/lots of play space, \$350. Valdez, 897-4724.

PENTIUM COMPUTER, 233 MMX, 64MB RAM, 3.3GB HD, monitor, speakers, 56K modem, Win 98, MS Office 2000, great for school, \$275. Mounho, 299-0883.

ESTATE/MOVING SALE, Sat.-Sun., July 28-29, 9 a.m.-4 p.m., 1525 Gadwall Road NE, Rio Rancho (River's Edge/Hwy. 528). Claussen, 293-9704.

RAINBIRD CPF-100 1-in. electric inline sprinkler valves, used 1 year, \$15 ea. new, asking \$25 for 5. Berg, 296-2695.

DSL MODEM, Ciscos 675, external, \$50 OBO; Ethernet PCI card, Intel PRO/100+, \$10; Microsoft FrontPage v1.0 for Macintosh, \$25 OBO. Loucks, 255-9444.

PENTIUM 233, upgradeable to 550, 8.5GB HD, 32MB RAM, monitor, etc., \$250; girl's 21-spd. bike, \$45; 250MB Zip drive, \$35. Roberts, 275-2941, ask for Daniel.

PARTS FOR '79-'81 280ZX, new, more than 40 items for tune-ups, brakes, suspension, & more, \$275 for all. Michaels, 892-2459, leave message.

GE WASHER/ELECTRIC DRYER SET, 5 yrs. old, \$350. Guthrie, 822-0968.

TRANSPORTATION

'85 FORD BRONCO II, Eddie Bauer, V6, rebuilt engine (3K), AT, new parts, \$2,300. Sleeman, 845-5823.

'93 FORD TAURUS, 4-dr., AT, 65K miles, AM/FM cassette, great condition, \$3,250. Carrillo, 877-2129.

'69 VW BUG, runs well, needs only minor body work, \$1,500 OBO. Dominguez, 292-2830, ask for Christine.

'84 MERCEDES BENZ 380SL, gold/gold, 2nd owner, AT, 110K miles, hard/rag tops, beautiful car, \$11,000 OBO. Smith, 822-0022.

'88 MAZDA RX-7, new motor (15K miles), new drive line (6 mo.), good tires, \$2,500. Steele, 286-0040.

'00 FORD F250 XLT, reg. cab, 4x4, 6K miles, V10, extras, paid \$25,000 in Jan. 2001, asking \$21,000. Dobbs, 281-1958.

'89 OLDSMOBILE CALAIS, 90K miles, V6, 4-dr., AT, AC, AM/FM, PW, PL, great condition, \$2,400. Mayberry, 293-4025.

'91 DODGE STEALTH, 121K miles, great looking sports car, runs excellent, fun to drive, MT, AC. Krein, 296-7446 or 540-1244, ask for Jason.

'00 TOYOTA SIENNA VAN, FWD 5-dr. CE, 18,600 miles, white/dark gray, rear AC, luggage rack, gray cloth interior, alloy rims, CD/cassette, very clean, \$20,800. Dwyer, 271-1328.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:

- E-MAIL: Janet Carpenter (jacarp@sandia.gov)
- FAX: 844-0645
- MAIL: MS 0165 (Dept. 12640)
- DELIVER: Bldg. 811 Lobby
- INTERNAL WEB: On Internal Web homepage, click on News Center, then on Lab News frame, and then on the very top of Lab News homepage "Submit a Classified Ad." If you have questions, call Janet at 844-7841. Because of space constraints, ads will be printed on a first-come basis.

Ad rules

1. Limit 18 words, including last name and home phone (We will edit longer ads).
2. Include organization and full name with the ad submission.
3. Submit the ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. One ad per issue.
6. We will not run the same ad more than twice.
7. No "for rent" ads except for employees on temporary assignment.
8. No commercial ads.
9. For active and retired Sandians and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. We reserve the right not to publish an ad.

'90 JEEP WRANGLER, 45K original miles, 6-cyl., 5-spd., hardtop, AC, Rancho suspension, premium wheels & tires, no off-road, excellent condition, \$9,500. Gonzales, 292-6308.

'89 FORD PROBE, good condition, well maintained, 143K miles, \$2,500 OBO. Cardenas, 897-4641, ask for Judy.

'86 TOYOTA CUSTOM CAB PICKUP, 4WD, 4-cyl., 5-spd. AC, AM/FM cassette, 155K miles, camper shell, \$4,000. Knight, 565-8105.

'83 FORD F250 XLT, LWB, ext. cab, 460, 4-spd., PS, AC (works), AM-FM, cruise, dual exhaust, shell, towing, \$2,500. Yarbber, 821-1002.

'99 BMW M3 COUPE, green/gray leather, 5-spd., sunroof, loaded, mint condition, 10K miles, \$39,000. Pundit, 821-3295.

'95 TOYOTA PREVIA S/C VAN, 43K miles, all records, power windows/locks, AC, AT, alarm system, \$11,900. Woodall, 821-1736.

'96 HONDA CIVIC EX, fully loaded, excellent condition, AC, AM/FM, CD, sunroof, PW, PL, \$8,750 OBO. Martinez, 833-5670.

'90 TOYOTA CAMRY, very good condition, 109K miles, 1 driver, garaged overnight, cherry red, \$4,300 OBO. Smith, 232-9838.

'97 FORD F150, Super Cab, 4x4, AT, alloy wheels, tow pkg., bed liner, ARE bed cover, power everything, 56K miles, runs/looks perfect, \$16,900. Robbins, 292-7355.

'95 MERCURY GRAND MARQUIS GS, excellent condition, 1 owner, 25K miles, \$9,250. McConahy, 884-5071.

'97 TOYOTA T-100, 59K miles, V6, extra cab, standard transmission, w/matching shell, transferable extended warranty to 70K miles, great condition, \$15,000. Giersch, 228-3528.

'85 MAZDA RX-7 GSL-SE, fuel-injected, 5-spd., 2 tops, immaculate, new brakes & tires, garaged, full records, \$3,500. Smith, 281-9666.

'94 MAZDA B-4000 LE, extended cab, 39K miles, AT, cruise, PW, PL, Raven top, like new, \$7,800. Thacker, 867-2427.

'97 GRAND AM SE, 46K, 4-dr., V6, AT, AC, ABS, AM/FM/cassette, PW, PL, cruise, warranty, \$9,500. Sensi, 299-3958.

'86 FORD BRONCO II, low 62K miles, \$3,500. Flores, 291-0512.

'95 CORVETTE CONVERTIBLE, white/red, AT, only 20K miles, premium sound system & sport seats, \$24,000. Thalhammer, 298-8521.

'97 CHEVY CAVALIER, deep purple, Rally Sport, excellent condition, lots of extras, 129K highway miles, 2DD, 5-spd., \$8,000. Carlson, 281-2360.

'94 NISSAN SENTRA, 89K miles, 4-dr., 4-cyl., AC, radio, cassette, good condition, \$2,250 OBO. Schroll, 299-3371.

'98 TOYOTA TACOMA SR5, X-cab, AC, cruise, 54K miles (12K tow), \$12,400 OBO. Tucker, 821-5448.

'82 CUSTOMIZED C7, 6-cyl., soft & hard tops, 89K original miles, \$14,000 in new parts, \$10,500. Savage, 890-4796.

'99 CHEVY S-10 PICKUP, ext. cab, 2.2-liter, 5-spd., AM/FM, bed liner, 16K miles, \$9,995. Finch, 296-6663.

'92 MITSUBISHI ECLIPSE, white, 83K, good 1st car, runs great, only 1 owner. Collins, 883-2597.

'94 GRAND VOYAGER SE, 98.5K miles, 3.3L, AT, all power, front & rear AC, cruise, quad seating, excellent condition, \$7,995. Hightower, 247-3009.

'91 HONDA CIVIC DX, 3-dr., red, 5-spd., AC, 80K miles, \$4,350. Padilla, 898-9501.

'95 CHEVY SILVERADO XCAB 350, Z71, Sportside, 59K miles, matching shell, great condition, \$15,500. Hart, 323-0415.

'93 OLDSMOBILE SILHOUETTE, mini-van, 3.8L V6, rear air, power everything, ABS, leather, cruise, towing package, 112K miles, \$5,995. Blanford, 292-6494.

'86 FORD BRONCO, brand-new 4WD & drive shaft, good condition, \$2,500 OBO. Johnson, 892-5009.

'94 NISSAN XE KING CAB PICKUP, 5-spd., 64,800 miles, great condition, 1 owner, \$5,500. Young, 821-9852.

'96 CHEVY 4x4, 1/2-ton, Z-71, ext. cab, short bed, step-side, white, V8, alarm, 100K miles, \$13,500. Schwaner, 828-1404.

'65 MUSTANG 289, 4-spd., 15K miles on rebuilt motor, new clutch, headers, Flowmaster exhaust, \$8,500. Jansma, 294-3524.

'79 CHEVROLET CAPRICE, classic station wagon, 93,020 miles, well maintained, nonsmoker retiree, \$1,750. Sublett, 884-4654.

RECREATIONAL

'79 AIRSTREAM ARGOSY TRAILER, 20-ft., very lightweight, super condition, many upgrades, \$5,200. Shaw, 857-9236.

'78 YAMAHA XT 500, on/off road, 6K miles, great condition, \$1,200. Lobitz, 341-9677.

'97 MINNIE WINNIE, 31-ft., Class C, queen island bed, Ford V10, AC, ent. ctr., 23K miles, recent full service, vacation ready, \$39,500. Stein, 250-1120.

GO-KART, Carter-2335, 2-seater w/roll bar, 6 yrs. old, excellent condition, all records, \$425 OBO. Serna, 899-9618.

'99 SMOKERCRAFT PONTOON BOAT, 22-ft., 90 Merc, electric downriggers & trolling motor, fish-finder, full canvas, \$22,000 OBO. Hostetler, 898-3785.

TOURING BICYCLE, Gitane, 17-in., white, \$200. Luther, 822-1187.

'82 GOLDWING ASPENCADE, new tires, brakes, battery, rebuilt carbs & steering, \$2,000 OBO. Hebron, 281-2901.

HERITAGE KAYAK, 16-1/2 ft., 2-person, used twice, \$1,150 retail, asking \$700. Healer, 298-6967.

RUBBER RAFT, good condition, 2-person, \$65; also, still have the bunk beds, \$75. Chavez, 842-6374, after 6 p.m.

'99 KTM EXC 250 DIRT BIKE, very clean, runs excellent, \$4,000 OBO. Hanson, 264-0622 (cell) or 891-4681, ask for Mark.

'97 HONDA ST1100 MOTORCYCLE, red, Givi backrest/trunk, 6K miles, beautiful, \$9,600. Berg, 573-0557.

PORTA-BOAT, 12-ft., folds 4 in. width, roof rack, trolling & outboard motors, sail, oars, dollies, \$3,200. Orman, 332-7782.

'87 CRUISEAIR MOTORHOME, 28-ft., 4KW generator, towing pkg., 58.5K miles, 454 engine w/28K miles, \$9,000 OBO. Mead, 294-2298.

'71 VOLKSWAGEN CAMPMOBILE, engine rebuilt for higher performance, new top, original attachable tent, 2 Sandian owners, \$3,200. Stevens, 505-776-8230 (Arroyo Seco, N.M.).

REAL ESTATE

2-BDR. MOBILE HOME, '80 Windsor, 14' x 70', 1-1/2 baths, Wyoming Plaza Park, \$7,000 OBO. Chavez, 836-4164.

3-BDR. CUSTOM HOME, North Valley, 3 baths, 1,938 sq. ft., fireplaces, patio, ceramic tile floors, slab granite countertops, vigas, nichos, plant shelves, \$239,000. Thomas, 269-9571 or 899-2905.

2.57 ACRES, privacy & beauty of East Mountain living, forested, Entranosa water, cul-del-sac, CCRs, \$50,000+5,000. Campbell, 281-0744.

3-BDR. HOME, gated retirement community, Edith Blvd., quiet, secure, 1,800 sq. ft., 2 baths, must sell, \$69,000. Peterson, 254-0918.

3-BDR. BRICK HOME, 1-3/4 baths, 1,861 sq. ft., remodeled kitchen, hardwood floors, huge 2-car garage, \$139,800. Dabney, 857-2352, ask for Dick.

2-BDR. CONDO, 1,100 sq. ft., NE Heights, 1-3/4 baths, fireplace, ceiling fans, hardwood floors, pool/hot tub, \$79,000. Chavez, 839-9363.

1.46 ACRES below Manzano Park, paved road. Morales, 898-1477.

2-BDR. TOWNHOUSE, Green Valley, Ariz., 2 baths, end unit, immaculate, desirable location, \$89,500 unfurnished, \$92,000 beautifully furnished. Brown, 291-3280.

5-BDR. WESTCLIFFE CO. HOME, new, on 60 acres, \$450,000. Ling, 281-5328, ask for Marguerite.

3-BDR. RAYLEE HOME, 2 baths, MBR w/3-way gas fireplace, cathedral ceilings, great location, must sell, \$135,000 OBO. Valerio, 890-4538.

WANTED

ROOMMATE, to share beautiful 2-bdr. apartment 4 blks. from UNM, hardwood floors, washer/dryer, \$250 DD, \$300/mo. + 1/2 utilities. Atchison, 262-9598.

FRUIT FROM YOUR YARD for the Asbury Methodist Cafe, will happily pick. Rezac, 281-1816.

RELIABLE CAR, for a student, prefer AC & heat, AT, \$1,000. Kovarik, 897-2188.

DONATIONS of mechanical engineering texts (college and graduate level) for mechanical engineering student. Baldo-Pulaski, 345-0432.

MAN'S BIKE & WOMAN'S BIKE. Demo, 828-2017.

USED CLOTHING in small sizes for children & adults in rural Guatemala; T-shirts, ball caps, blue jeans, toys, games, towels, wash cloths, bed sheets, etc.; I will pick up. Hamilton, 858-1371.

OLD WOOD-CARVING CHISELS for a new wood-carver. Aragon, 292-8883.

HOUSEMATES, NE Heights, 2,000 sq. ft., 4-bdr., Jacuzzi, garage; 1 person, 2 rooms, \$500; or 2 persons, \$350 ea. Dickerson, 323-5280.

INFORMATION: Have you had or are you having delays in changing from HMO or Top [medical plans] to Medicare? Illing, 828-1828.

APPLE IIE SOFTWARE (programming languages, games); hardware (disk drives, printer), for student; also, Thule hardshell cartop carrier for rack. Murphy, 294-1778.

COFFEE TABLE, college student looking for one in usable condition, preferably rectangle (max. \$60). Archuleta, 565-9481.

HOUSEMATE to share 3-bdr. home w/1 other person, near UNM/Nob Hill, nonsmoker, no pets, \$300 + 1/2 utilities + DD. Gurule, 268-2244.

SOMEONE TO SHARE MY NANNY, starting mid August, my home or yours, prefer Montgomery/Tramway area but negotiable. Wampler, 299-4910.

CERAMICS KILN, electric, 10-cone firing capacity, preferably hexagonal shape w/lid at top. Rockwell, 884-4206.

RIMS TO FIT '68 CHEVY C10, custom or stock, 15-in. 6-hole pattern. Ritchey, 299-7082.

LOST & FOUND

HAND TOWEL, w/Lobos & Sandia Casino printed on it, found in Bldg. 800 parking lot. Ortega, 844-1809.



<http://www.savingsbonds.gov>

Sandia successfully deploys targets during latest flight test in national missile defense series

By John German

The latest missile defense intercept over the Pacific July 14 launched a new round of controversy in Washington, Moscow, and Beijing. But under the diplomatic radar, Sandia payload experts again prepared the target arrays that tested the US interceptor's abilities to recognize and engage reentry vehicles (RVs) in the presence of other objects.

The latest national missile defense flight test on Saturday, July 14, known as Integrated Flight Test #6 (IFT-6), was an absolute success from Sandia's perspective, says Eric Reece (15401), Sandia program manager for missile defense activities.

"Everything on our end appears to have worked," he says.

At approximately 7:40 p.m. PDT, Lockheed Martin's Multi-Service Launch System (MSLS, using boosters from decommissioned Minuteman II ICBMs) lifted off from Vandenberg Air Force Base, Calif., and carried the Sandia payload into space. After separation from the booster system, the launch-system front section deployed the Labs' RV and balloon decoy.

Twenty-one minutes after launch an interceptor lifted off from Kwajalein Atoll in the South Pacific. Sensors aboard the interceptor successfully distinguished between three objects — the mock RV, the launch-system front section, and the balloon decoy — and the interceptor, travelling at 16,200 miles per hour, destroyed the RV.

"Truth data" about the RV, gathered by Sandia instrumentation and radioed to the ground, are being compared with data gathered by the interceptor during its flight and target acquisition.

Sandia targets have been aboard all six IFT flight tests so far, and the Labs already is working on a target payload for IFT-7, planned for later this year, says Eric.

"Sandians from across the Labs contributed to the success of this project," says Jerry McDowell, Director of Aerospace Systems Development Center 15400. "Thanks and congratulations to all for your hard work and dedication."

The test was led by project manager Bob Sheldahl (15415). Contributing organizations included Centers 15400, 14100, 12600, 9100, 2300, and 2600.

The US Army's Space and Missile Defense Command manages the IFT program for the Ballistic Missile Defense Organization.



INTO THE SUNSET — The MSLS, just visible in the center of the photo near the setting sun, lifts off from Vandenberg Air Force Base carrying the Sandia target payload at 7:40 p.m. PDT July 14. (Photos by Diana Helgesen, 15419)

Feedback

What's the motivation for topped-out employees?

Q: Like many here, I am at the top of my salary band in my IJS classification. The IJS description clearly states that the system is not to reward performance or hard work. It also says that managers cannot move employees from their bands simply because they have reached the top. Meanwhile, what system at Sandia is the way to reward hard work and excellent performance when the IJS system will not allow the managers to grant appropriate raises? Does Sandia actually expect people at the top of their bands to maintain their high level of performance and effort for the rest of their careers here for zero raises, not even cost-of-living raises?

A: One of the principles of the Integrated Job Structure (IJS) is that movement to a new level should not be done simply to reward good performance. Instead, movement to a new level should be based on meeting all the level criteria in the level charts and consistently demonstrating performance commensurate with the new level. Career progression should be discussed with managers to determine what each individual can do to broaden their jobs and obtain new skills in order to potentially progress to the next level or ladder within the IJS. Moving within the IJS is separate from Sandia's compensation review. During the compensation review, employees are rewarded for their performance and value of contribution. However, base salaries are limited in range due to established salary bands. Sandia's salary bands are set based on market data and are intentionally broad to allow a wide range of pay. Salary bands are adjusted yearly based on new market data, so even if you are at the top of the salary band one year, it does not necessarily mean you will continue to be above band in following years. In addition, managers have the ability to reward performance and hard work for employees at the top of their salary bands through nonbase awards.

— Don Blanton (3000)

Coronado Club

July 28 — Dance party, 9 p.m.-3 a.m. Tunes, drinks, and snacks. Free to members, \$2 guests.

July 29 — Sunday brunch, 11 a.m.-1 p.m., music by the Roger Burns Trio; \$6 members; \$7 guests.

C-Club Swimming Pool — Lap swim: Mon.-Fri., 6-7 a.m. & 10 am-12:30 p.m.; Mon.-Tues. nights, 6-7 p.m.; Recreation Swim: Mon.-Tues., 12:30-6 p.m.; Wed., 12:30-5 p.m.; Thurs.-Fri., 12:30-9 p.m.; Sat.-Sun., 11 a.m.-6 p.m.

Sandia Weapon Intern Symposium targets retired weapons

A Weapon Intern Program symposium on retired weapons will be held Aug. 6-9 in the Bldg. 810 auditorium for Sandians who work in the nonproliferation community and weaponeers who need to understand how nuclear weapon systems have evolved.

Roger Hagenruber, Senior VP for National Security and Arms Control, is the sponsor and will introduce the symposium. Weapon interns will present briefings on retired nuclear weapons.

The symposium runs from 9 a.m.-4 p.m. on Monday and 8 a.m.-4 p.m. Tuesday through Thursday of that week.

You must be Q-cleared, have a need to know, and register via the following web site to attend: <http://symposium.sandia.gov>. Additional information is at that site.

